

Appl. No. 10/709,569  
Amdt. dated November 30, 2004  
Reply to Office action of August 31, 2004

### **REMARKS/ARGUMENTS**

In response to the Office action identified above, please accept the following remarks.

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#### **1. Response to the rejection of claims 1-6, 8-16, 19:**

Claims 1-6, 8-16, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Norstrom et al. (6,657,242).

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As for claims 1, 14, the patent discloses a bipolar transistor in figure 7 and 13b composed of a substrate, a dielectric layer (147) on the substrate having an opening to expose a portion of the substrate, a doped polysilicon sidewall (129) on the periphery of the opening to define a base region underneath the opening, an intrinsic doped base region as shown in figure 5 at the bottom of the opening, a spacer (131) on the polysilicon sidewalls to define emitter region (143) established by a conductive filler and a PN junction formed between the base and the emitter regions. Although the claim terminologies are not necessarily used to express the same elements in the patent (such as "self aligned", and "base region defines by the heavily doped polysilicon layer") it would have been obvious to one skilled in the art to conclude that all claimed elements are addressed by the patent since expression terminologies are variable and subjective in nature.

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As for claims 2-5, 15, the polysilicon layer is made from a heavily boron doped material and the substrate is silicon. As for the expression "non-selective" to define the substrate, the expression is considered to be subjective that does not have physical feature differentiating it from the silicon substrate in the prior art.

As for claims 6, 16, it is clear that silicidation process is inherent to the emitter electrode formed on the highly doped emitter interface. Beyond that, silicides are notoriously known contact materials in the art that are used to accommodate the resistivity difference between highly doped semiconductors and pure metals.

As for claims 8, 9, the polysilicon layer is extended on the substrate beyond the periphery of the opening. Although the extension is the same continuous material, it is clear that the end performance of joined conductive pieces and the single conductor in the prior art is similar.

As for claims 11, 18, a deep isolation trench segregates the active structure laterally from other elements in the substrate.

As for claims 13, 19, the intrinsic doped base region is made from boron implant.

**Response:**

To overcome this rejection, claim 6 is merged into claim 1, and claims 18, 19 are merged into claim 14 as listed in the above

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AMENDMENTS TO THE CLAIMS section. Claims 6, 18, 19 are therefore canceled. No new matter is introduced in the amended claims 1 and 14.

The amended claim 1 introduces the feature disclosed in the original  
5 claim 6 to emphasize that, "the bipolar junction transistor further  
comprises a selective implant collector region formed in the substrate  
beneath the opening for forming the intrinsic base doped region".  
Norstrom et al. never teaches the feature of "selective implant collector  
region" in the bipolar junction transistor shown in FIG. 7 and FIG. 13b.  
10 The Examiner does not mention the feature of "selective implant  
collector region" in the rejection reason to the original claim 6, either.  
The Applicant therefore respectfully believes that the amended claim 1 is  
completely different from Norstrom et al.'s disclosure, and one skilled in  
the art cannot conclude all claimed elements in the amended claim 1 from  
15 Norstrom et al.'s disclosure. Reconsideration of the amended claim 1 is  
politely requested.

The amended claim 14 introduces the feature disclosed in the original  
claims 18 and 19 to emphasize that, "the bipolar junction transistor  
20 further comprises at least a deep isolation trench formed in the substrate  
and at least a channel stop region formed in the bottom of the deep  
isolation trench". Norstrom et al. never teaches the feature of "channel  
stop region" in the bipolar junction transistor shown in FIG. 7 and FIG.  
13b. The Examiner does not mention the feature of "channel stop region"  
25 in the rejection reason to the original claim 19, either. The Applicant  
therefore respectfully believes that the amended claim 14 is completely  
different from Norstrom et al.'s disclosure, and one skilled in the art

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cannot conclude all claimed elements in the amended claim 14 from Norstrom et al.'s disclosure. Reconsideration of the amended claim 14 is politely requested.

5 As claims 2-5, 8-13, and 15-16 are dependent upon the amended claims 1 and 14, they should be allowed if the amended claims 1 and 14 are allowed. Reconsideration of claims 2-5, 8-13, and 15-16 is therefore requested. Claims 6 and 19 are canceled and are therefore no longer in need of consideration.

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**2. Response to the objection of claims 7, 17, 18:**

Claims 7, 17, 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

**Response:**

20 The Applicant appreciates the allowable decision made by the Examiner, however, the Applicant is confused by the rejection reasons to claims 8 and 18 indicated on page 3 of the Office communication paper no. 20040527. The rejection reason to claim 8 refers to the content in claim 7, and claim 18 is rejected but would be allowable. The Applicant  
25 believes that the allowable claims are incorrectly numbered in the Office communication mentioned above.

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Since claims 7 and 17 are dependent upon the amended claims 1 and 14, they should be allowed if the amended claims 1 and 14 are allowed. Reconsideration of claims 7 and 17 is therefore requested. Claim 18 is canceled and is therefore no longer in need of consideration.

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**3. Introduction to new claim 21:**

Claim 21 is introduced by merging the original claims 1, 11, and 12. No new matter is introduced. Claim 21 is added to emphasize the feature that, "the bipolar junction transistor further comprises at least a deep isolation trench formed in the substrate and at least a channel stop region formed in the bottom of the deep isolation trench". Norstrom et al. never teaches the feature of "channel stop region". The Examiner does not state any rejection reason to the "channel stop region" disclosed in the original claim 12, either. The Applicant therefore respectfully believes that claim 21 is completely different from Norstrom et al.'s disclosure, and one skilled in the art cannot conclude all claimed elements in claim 21 from Norstrom et al.'s disclosure. Consideration of claim 21 is politely requested.

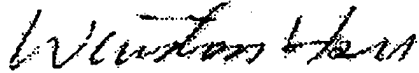
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Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

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Sincerely yours,



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